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~~CLAIMS~~

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1. A texturing system for use in a three-dimensional imaging system, and comprising:

memory means (22) for storing mip-map data for use in
5 texturing an image, the mip-map data comprising a hierarchical series of mip-maps of different levels of decreasing resolution;

input means (26) for receiving input data indicating the type of mip-map data required and the level of the
10 mip-map or mip-maps from which the data is to be taken;

control means (24) coupled to the input means and to the memory means for retrieving from memory the mip-map data required in accordance with the input data; and

cache means (30;60) coupled to the control means for
15 storing portions of mip-map data retrieved from memory and relating to a selected mip-map level; and

lower-level mip-map generator means (36;66) coupled to the cache means for generating portions of the mip-map next below in the hierarchical series of mip-maps of which
20 portions are held in the cache means;

trilinear interpolator means (34;64) coupled to the cache means to receive mip-map data from one level of mip-map and to the lower level mip-map generator to receive mip-map data from the mip-map next below in the
25 heirarchical series and to interpolate an output texel from input texels from the two received mip-map levels.

2. A texturing system according to claim 1, including decompression means (32;62) for decompressing mip-map data, the mip-map data being stored in the memory means in compressed form.

3. A texturing system according to claim 2, in which the decompression means (32;62) is connected with its input

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coupled to the cache means and its output coupled both to the trilinear interpolator means and to the lower-level mip-map generator means.

4. A texturing system according to claim 2 or 3, in which there are four cache means (60) and four decompression means (62) arranged in parallel.

5. A texturing system according to claim 2, 3 or 4, further comprising allocating means (82) between the cache means (60) and the decompression means (62), for allocating the outputs of different caches to selected ones of the decompression means.

6. A texturing system according to any preceding claim, in which the lower-level mip-map generator means comprises four interpolators which operate on 16 texels from the mip-map held in the cache means to provide four texels as from the next lower mip-map.

7. A method of texturing for use in three-dimensional imaging, and comprising the steps of:

storing in memory mip-map data for use in texturing an image, the mip-map data comprising a hierarchical series of mip-maps of different levels of decreasing resolution;

receiving input data indicating the type of mip-map data required and the level of the mip-map or mip-maps from which the data is to be taken;

retrieving from memory the mip-map data required in accordance with the input data; and

storing in a cache portions of mip-map data retrieved from memory and relating to a selected mip-map level; and

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generating in real-time portions of the mip-map next below in the hierarchical series of mip-maps of which portions are held in the cache means.

5 interpolating an output texel from input texels from the mip-map level stored in the cache and the mip-map next below in the heirarchical series generated in real time.

8. Apparatus for generating texture data for use in texturing an image, comprising the steps of:

10 means for representing texture data by arbitrary compressed codes, in which selected compressed code values define principal colors and other compressed code values define colors which can be formed by selected weighted averages of principal colors, the corresponding code values also being weighted averages of the code values of the selected principal colors; and

15 interpolating means for interpolating an output texel from a plurality of input texels;

characterised in that:

20 the interpolating means effects the interpolation using compressed code values.

9. A method of generating texture data for use in texturing an image, comprising the steps of:

25 representing texture data by arbitrary compressed codes, in which selected compressed code values define principal colors and other compressed code values define colors which can be formed by selected weighted averages of principal colors, the corresponding code values also being weighted averages of the code values of the selected principal colors;

30 interpolating an output texel from a plurality of input texels;

characterised in that:

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the interpolating step is effected using compressed code values.

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